

4th European Sustainable Phosphorus Conference (ESPC4)

and 5th European Phosphorus Research Meeting (PERM5)

20 – 22 June 2022, Vienna Austria - and online (all plenary and parallel sessions marked "hybrid") Online sessions will be available for replay, for registrants only, after the conference.

Andaz Vienna Am Belvedere (Hyatt), Arsenalstrasse 10, Vienna, Austria.

V10/06/2022 Programme updates and registration https://phosphorusplatform.eu/espc4



ESPC4 – Day 1 - Monday 20th June 2022

Foto: Wikipedia

8h30 - 9h00 - registration, welcome refreshments - networking

9h00 - 10h15 - Plenary - Opening and keynotes - Climate, nutrients and eutrophication

Moderated by Sonja van Renssen, Environmental Journalist and Editor-in-Chief, Energy Monitor

- Conference opening Jürgen Czernohorszky, Councillor for Climate and Environment, Vienna City Council Ludwig Hermann, ESPP President
- Climate, energy, agriculture: What has to be done about phosphorus and nutrients? Franz Josef Radermacher, Research Institute for Applied Knowledge Processing (FAWn), Ulm
- Interactions between climate change, phosphorus losses and eutrophication: Wenfeng Liu, China Agricultural University, Beijing

10h15 – 11h00 – break – posters – stands – networking – refreshments / confectionary

11h00 – 12h45 – Plenary – Regional, national and city phosphorus policies

- Perspectives for nutrient policy and action for the Baltic, Lotta Ruokanen, HELCOM
- Implementation of Switzerland's 2016 P-recycling regulation: Sibylla Hardmeier, Swiss Federal Office for the Environment (FOEN/BAFU)
- Implementation of Germany's 2017 P-recycling regulation: Andrea Roskosch, German Federal Environment Agency (UBA)
- Towards national phosphorus recycling policy in Austria: Arabel Amann, Wien Energie
- Phosphorus recycling from sewage sludge Strategy of the Canton of Zurich", Leo Morf, AWEL Canton Zürich
- Vision for implementation of the German P-recovery obligation by a regional water operator: Daniel Klein, Emschergenossenschaft and Lippeverband
- Case study: Vienna City, Florian Huber, Vienna City and Arabel Amann, Wien Energie

12h45 – 14h15 – lunch - posters – stands – networking

<u>14h15 – 15h45 – Parallel sessions</u>

- Nutrient recovery operating experience technology showcase (hybrid) (companies in ESPP-DPP-NNP Nutrient Recovery <u>Technology Catalogue</u>) Moderator/rapporteur: Karyn Georges, Isle Utilities & Veronica Santoro, ESPP
- Phosphorus recovery from ashes Moderator/rapporteur: Paulo Pavinato, University of São Paulo & Christian Adam, Federal Institute for Materials Research and Testing (BAM)
- Biochars and hydrothermal carbonisation Moderator/rapporteur: Christian Del Valle Velasco, Université Laval, Canada & INRAE & Tabea Knickel, German Phosphorus Platform (DPP)

Speakers for parallel sessions in special programme section, below

15h45 -16h30 - break- posters - stands - networking - refreshments / confectionary

16h30 – 17h45 – Plenary Business perspectives for nutrient sustainability

Moderated by Sonja van Renssen, Environmental Journalist and Editor-in-Chief, Energy Monitor

- Reports from parallel sessions, questions and discussion
- Business vision statements from nutrient sustainability leading companies Matt Kuzma, Ostara Wim Moerman, NuReSys José María Gómez Palacios, Biomasa Peninsular Henk Aarts, N2 Applied Leonie Boller, Ductor Christophe Guyot, Holcim Hubert Halleux, Prayon Hanane Mourchid, OCP Group Marina Ettl, Yara
- The fertilisers industry, phosphorus sustainability and the Green Deal Jacob Hansen, Fertilizers Europe
- Market perspectives for phosphate fertilisers and other uses of phosphorus, and place of recycling: Alberto Persona, Principal Analyst Fertecon/HIS
- ESPP to cover nitrogen recovery and recycling, Olivier Bastin, ESPP

19h00 Evening networking event:

19h00 Pre-dinner drinks.

20h00 Conference dinner,

22h00 Big John Whitfield & The Vienna Soul Society

Vienna City Hall festivities hall (Rathaus Festsaal) 30" by metro, 50" by foot from Andaz hotel.



Foto: Wikipedia

ESPC4 – Day 2 - Tuesday 21st June 2022

9h00 - 10h30 - Plenary - EU Policies

Moderated by Sonja van Renssen, Environmental Journalist and Editor-in-Chief, Energy Monitor

- Transition from a linear to a circular economy demonstrated by the new Fertilising Products Regulation, Johanna Bernsel, Deputy Head of Unit, European Commission DG Grow
- Implementation of the nutrient loss reduction target set by the Green Deal Farm-to-Fork and Biodiversity Strategies: European Commission, Isidro Campos-Rodriguez, European Commission DG Agriculture
- Business vision statements from nutrient sustainability leading companies Christian Guillaume, Sulzer Pumps Jean-Christophe Ades, Kemira Clement Houllier, Phosphea (Groupe Roullier) Matthias Staub, Veolia Tanja Schaaf, Metso:Outotec Group Anne Marie Henihan, Ireland Dairy Processing Technology Centre Matthias Rapf, FlashPhos project for Italmatch and University of Stuttgart Michel Elia Riechmann, VaLoo
- Towards an integrated EU approach, the proposed INMAP (EU Integrated Nutrient Management Action Plan) Andrea Vettori, Deputy Head of Unit, European Commission DG Environment
- Industry innovation in phosphorus chemistry and sustainability perspectives: Eva-Maria Leuschner, Clariant

10h30 – 11h15 – break – posters – stands – networking - refreshments / confectionary

<u>11h15 – 12h45 – Parallel sessions (speakers presented in special programme section below)</u>

- New fertilisers for nutrient sustainability Moderator/rapporteur: Sonja van Renssen, Energy Monitor & Veronica Santoro, ESPP
- Emerging nutrient recovery technologies (hybrid) Moderator/rapporteur: Ana Robles, IRTA, Ghent University / Biorefine Cluster & Ana Soares, Cranfield University
- Policies and regional actions for phosphorus sustainability Moderator/rapporteur: Lukas Egle, European Commission JRC (Joint Research Centre) & Geneviève Metson, Linköping University, Sweden

12h45 – 14h15 – lunch - posters – stands – networking

14h15 – 15h30 – Plenary – Visions and Actions

Moderated by Sonja van Renssen, Environmental Journalist and Editor-in-Chief, Energy Monitor

- Reports from parallel sessions, questions and discussion
- Vision statements from ESPC4 sponsors
 Pär Larshans, Chief Sustainability Officer, Ragn-Sells Group / EasyMining
 Wolfgang Hofmair, Borealis Group
 Teresa Schubert, Wien Energie
- Experience and future objectives of the nutrient platforms in Europe and worldwide Chris Thornton, European Sustainable Phosphorus Platform (ESPP) Jacob Jones, North Carolina State University, for STEPS (US National Science Foundation's new Convergence Research Center for Phosphorus Sustainability) Tabea Knickel, German Phosphorus Platform (DPP) Nathalie Tijdink, Netherlands Nutrient Platform Matt Scholz, US Sustainable Phosphorus Alliance (SPA)

15h30 – 16h00 – break – posters – stands – networking - refreshments / confectionary

16h00 – 17h00 – Plenary – Perspectives and Conclusions

Moderated by Sonja van Renssen, Environmental Journalist and Editor-in-Chief, Energy Monitor

- What the Green Deal means for EU policies on nutrients, Virginijus Sinkevičius, European Commissioner for Environment
- Perspectives for global nutrient management, Sinikinesh Jimma, United Nations Environment.
- Conclusions of the "Our Phosphorus Future" Report, Will Brownlie, UK-CEH Edinburgh
- Panel discussion on perspectives for phosphorus sustainability policies Johanna Bernsel, European Commission, DG Grow Heide Spiegel, Austrian Agency for Health and Food Safety Jacob Hansen, Fertilizers Europe Else Bünemann, Research Institute of Organic Agriculture (FIBL) Tamsyn Kennedy, Scottish Water Chris Thornton, European Sustainable Phosphorus Platform (ESPP)

17h00 – ESPC4 Conference Closure

Tuesday evening social event:

19h00 – 22h00 The Third Woman – An immersive city adventure inspired by the classic movie "The Third Man"

Wednesday 22nd June 2022

Optional excursion:

8h30 Vienna sludge-to-energy and future P recovery facilities of Wien Energie. Max. 60 participants.

Same time as PERM5 morning sessions – you can attend either the sludge processing free excursion or PERM5 morning sessions.

5th Phosphorus in Europe Research Meeting (PERM5):

9h00 – 16h30, Andaz Vienna Am Belvedere (Hyatt). NOTE: additional registration fee required.

Young scientists and R&D networks event:

17h – 18h30 and Wednesday evening social.

Speakers for ESPC4 Parallel Sessions

ESPC4 Day 1: Monday, June 20th, 2022, 14:15 – 15:45 CEST

Parallel Session #1 (hybrid) Nutrient recovery operating experience technology showcase

- Marc Sonveaux, Prayon, Belgium
- Leon Korving, Vivimag WETSUS, The Netherlands & Bengt Hansen, Kemira Sweden
- Yariv Cohen, EasyMining (Ragn-Sells) N, P, and K recovery technologies
- Michiel Verspuij, ICL Fertilisers
- Henk Aarts, N2 Applied: Plasma treatment of slurry and digestate, sustainable fertiliser from air and electricity
- Arttu Laasonen, ENDEV Nutrient Recycling Technologies

Parallel Session #2:

P-recovery from ashes

- Werner Preisig, ERZO, Switzerland & Anders Nättorp, University of Applied Sciences and Arts Northwestern Switzerland School of Life Sciences Institute for Ecopreneurship (FHNW): Close the P-cycle: A solution in coorporation with cement industry
- Beatrice Decker, MFPA Weimar, Germany: Resin-in-Pulp technology, an adapted holistic approach for nutrient and P-recycling from sewage sludge ashes (Abonocare)
- Florian Benedikt, Vienna University of Technology (TU Wien), Austria: P-recycling from sewage sludge with fluidized bed incineration applying in-situ heavy metal removal
- Theresa Sichler, Federal Institute for Materials Research and Testing (BAM), Germany: European sewage sludge ash monitoring
- Lasse Fabian Köhl, Fraunhofer IKTS, Germany:
 Decentralised phosphorus recycling from sewage sludge using dust firing and in-situ heavy metal separation
 (DreiSATS)
- Laura Fiameni, University of Brescia and INSTM, Italy: Heavy metal stabilization in sewage sludge ash with poultry litter ash to enhance phosphorus recovery

Parallel Session #3:

Biochars and hydrothermal carbonisation

- Marc Buttman, TerraNova Energy, Germany: TerraNova®ultra - hydrochar from sludge, P-recovery and carbon sequestration
- Helmut Gerber, Pyreg, Germany: Biochar from biosolids: the climate-positive alternative to conventional phosphorus fertilizer
- Lisa Röver, Deutsches Biomasseforschungszentrum gGmbH, Germany: P-recycling via hydrothermal carbonization and the use of complexing agents and acids (Abonocare)
- Raquel Zambrano Varela, TreaTech, Switzerland:
 Phosphorus recovery from hydrothermally treated sewage sludge. Closing the P cycle.
- Clara Kopp, University of Copenhagen, Denmark: Activation of P-rich biochars and ashes to increase plant P availability
- Peter Axegård, C-Green AB, Sweden Hydrochar from different sources in soil applications

ESPC4 Day 2: Tuesday, June 21st, 2022, 11:15 – 12:45 CEST

Parallel Session #4

New fertilisers for nutrient sustainability

- Else Bünemann, FiBL, Switzerland:
 - Bio-based fertilizers as efficient alternative phosphorus sources for closing nutrient cycles (Lex4Bio)
- Farida Dechmi, Agrifood Research and Technology Centre of Aragon, Spain: Assessing phosphorus soil status and fertilisers management in the Ebro river intensive irrigated area (Spain)
- Alicia Hernández Mora, University of Natural Resources and Life Sciences Vienna (BOKU), Austria:
 Developing fertilizer compliance test methods for recycled P fertilizer products (Lex4Bio)
- Julia Santolin, University of Antwerp, Belgium: Comparative consequential LCA: microbial fertilizers grown on potato wastewater, common organic fertilizers: and mineral fertilizers
- Berta Singla, BETA Technological Centre (UCC-UVIC), Spain: Nutrient recovery from pig slurry – Production and agronomic quality assessment of added value bio-based fertilisers (Fertimanure)
- Kari Ylivainio, Natural Resources Institute Finland (Luke): Phosphorus losses from different soil types caused by bio-based fertilisers (Lex4Bio)

Parallel Session #5:

Emerging nutrient recovery technologies (hybrid)

- Pim De Jager, Aquacare, Netherlands: BioPhree: next generation solution to remove and re-use phosphate in surface & effluent waters to ppb-level.
- Adriana Romero Lestido, Cetaqua, Spain: Turning wastewater treatment plants into biorefineries: global value chain from bioresources to valuable products (LIFE Enrich)
- Anders Øfsti, Hias How2O AS, Norway: Sustainable Phosphorus Removal with the Hias Process
- Rubén Rodríguez-Alegre, LEITAT Technological Center & Universitat Politècnica de Catalunya, Spain: Innovative integration of membrane technologies for nutrient recovery from high organic load streams (FERTIMANURE)
- **Szabolcs Pap, University of the Highlands and Islands, UK:** New technology to recover phosphorus from wastewater within the Circular Economy: a Scottish case study (Phos4You)
- Lidia Paredes, BETA Technological Centre (UVIC-UCC), Spain: Recovering nutrients from aquaculture industry by-products for the production of bio-based fertilizers (Sea2Land)
- Sergio Lloret Salinas, EGEVESA, Spain: New urban wastewater treatment based on natural coagulants to avoid phosphorus pollution (LIFE Newest)
- Lukas Pohl, University of Stuttgart:

Industrial demonstration of the FlashPhos process – state of the project after one year"

Parallel Session #6:

Policies and regions for phosphorus sustainability

Katharine Heyl, Research Unit Sustainability and Climate Policy, University of Rostock, Germany:

Sustainable phosphorus management under the future Common Agricultural Policy?

- Francesco Avoglio, HERA Spa, Italy: Feasibility and sustainability assessment of struvite recovery solutions in Bologna, WWTP Italy
- Lisa Harseim, Albert-Ludwigs University of Freiburg, Germany:
 Cities revisited: Out-of-the-box governance of phosphorus flows in food
- Fabian Kraus, Kompetenzzentrum Wasser Berlin, Germany: Mandatory P-recovery from sewage sludge (ash) in Germany – a multiple-goal conflict?
- Esa Salminen, Vahanen Environmental Consultiny OY AFRY Project, Finland:
- Nutrient balance and handprint of the Finnish forest industry
 Anna Muntwyler, European Commission JRC Ispra:
- Modelling phosphorus dynamics in European agricultural soils and assessing phosphorus policy goals
- Sophia Schüller, FiW e.V. at RWTH Aachen University, Germany: The funding measure RePhoR - Regional Phosphorus Recycling



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Wednesday June 22nd, 2022

9h00 – 10h30 : Phosphorus recycling research & technology update

Moderator: Chris Thornton, Secretary General, ESPP

Welcome. Outcomes of PERMs 1-4. Meeting objectives and outputs Ludwig Hermann, President, ESPP

Introducing the Nutrient Recycling Community: a platform to exchange knowledge and good practices between research projects dealing with nutrient recycling in EU. Ana Robles Aguilar, Ghent University, Belgium

Greenhouse gas emissions from digestate composting **Bente Føreid, NIBIO, Norway**

Contributing to sustainable rural development and transition to a circular bioeconomy with a special focus on nutrient sustainability

Laia Llenas Argelaguet, BETA Technological Center (UVIC-UCC), Spain

Questions and discussion I

Phosphorus recovery technologies Erik Meers, Ghent University and Biorefine Cluster Europe, Belgium

LIFE projects: from R&D to pilot testing and implementation Federico de Filippi, CINEA

Questions and discussion II

Vision Statements from ESPP R&D Members: Adriana Romero Lestido, CETAQUA, Spain Matthias Rapf, University of Stuttgart Leon Korving, WETSUS Kari Ylivainio, LUKE Marzena Smol, IGSMIE PAN

10h45 – 12h15 : Parallel breakout sessions I

New and recycled phosphorus fertilisers (hybrid)

Moderator: Olivier Bastin, Acoso/ESPP Rapporteur: Veronica Santoro, ESPP

- Assessment of P availability and efficiency of recycled P fertilizers Recommendations for pot trial standardisation, Ana Robles, IRTA (Spain) and Ghent University / Biorefine Cluster Europe (Belgium)
- Efficacy of Actinobacteria-based biofertilizer to improve cereal plant growth under phosphate/potassium rocks fertilization, Kenza Boubekri, Mohammed VI Polytechnic University, Morocco
- Microbial phosphate solubilization: A potential alternative for increasing soil phosphorus sustainability, Wissal Elhaissoufi, Mohammed VI Polytechnic University, Morocco
- Farmers' perception and willingness to pay for bio-based fertilisers in the EU, Sergio Garmendia and Egor Moshkin, Ghent University, Belgium
- Reduced nitrous oxide emissions in a pot trial with novel organic NP(K)-char fertilizers, Carolyn-Monika Görres, Hochschule Geisenheim University, Germany
- Phenotypic and genotypic screening of potato cultivars for phosphorus efficiency, Mousumi Hazarika, University Rostock, Germany

Iron – phosphorus interactions in phosphorus recycling (coordinated by WETSUS)

Moderator: Leon Korving, Wetsus, Netherlands Rapporteur: Bengt Hansen, Kemira, Sweden

- Biological and chemical drivers over P availability from different P forms: an incubation experiment Ángel Velasco Sánchez, UniLaSalle Rouen, France
- Insight into direct phosphorus release from simulated wastewater ferric sludge: influence of hysiochemical factors Aseel Al Nimer, Wilfrid Laurier University, Canada
- Summary of P-Trap results: concepts to reduce diffuse P input to surface waters, Stephan Krämer, Universitat Wien, Austria
- The impact of P on Fe(II) catalyzed ferrihydrite transformation under oscillating redox condition, Xingyu Liu, University of Bayreuth, Germany
- Potential of recycled vivianite as P and Fe fertilizer from a mechanistic point of view, Rouven Metz, University of Vienna, Austria
- Research on Fe-P interactions at Wetsus for P recovery, Thomas Prot, TU Delft, Netherlands
- How phosphorus removal technologies in WWTP can impact the phosphorus recovery from sludge? Marie-Line Daumer, INRAE, France

Nutrient recovery from dairy industry processing wastewaters (coordinated by REFLOW)

Moderator: Jan-Philip Uhlemann, Wageningen University and Research, Netherlands Rapporteur: Ipan Hidayat, BETA Technological Centre (UCC-UVIC), Spain

- Multiple resource recovery from dairy processing waste. A circular economy approach for downstream valorization, Pablo Martín Binder, BETA Technological Centre (UCC-UVIC), Spain
- Hydrothermal carbonization of surplus sludge from effluent treatment in various milk processing factories, Marzena Kwapinska, University of Limerick, Ireland
- Safe Use of Dairy Processing Sludge and STRUBIAS Food System Fertilising Products in Agriculture Wenxuan Shi, Teagasc, Ireland
- Effects of dairy-processing-sludge (DPS) and derived hydrochar on greenhouse gas (GHG) emissions from maize field, Yihuai Hu, Aarhus University, Denmark

- Hydrochar a cheap efficient P-biofertilizer with low climate footprint, Sven Gjedde Sommer, Aarhus University, Denmark
- LCA of multiple scenarios for dairy wastewater treatment and P-recovery processes, Marta Behjat, Chalmers University of Technology, Sweden

12h15 – 13h30: Lunch Break

13h30 – 15h00 : Parallel breakout sessions II Phosphorus interactions in soils

Moderator: Victoria Barcala, Deltares, Netherlands Rapporteur: Jakob Santner, University of Natural Resources and Life Sciences, Vienna (BOKU), Austria

- Simulating long-term phosphorus, nitrogen, and carbon dynamics to advance nutrient assessment in dryland cropping, Bianca Das, University of Queensland, Australia
- Soil phosphorus mining in agriculture Impacts on P availability, crop yields and soil organic carbon stocks, Stefaan De Neve, Ghent University, Belgium
- DOC Addition Increases Phosphate Adsorption in Mediterranean Soils, Yaniv Freiberg, Volcani Center, Israel
- Soil phosphorus turnover in soils under long term P management, Olha Khomenko, Teagasc / University of Limerick, Ireland
- Changes of phosphorus forms in soil as a function of different fertilizing strategies, Martin Kulhánek, Czech University of Life Sciences Prague, Czech Republic
- The Effect of soil pH on phosphate solubility in soils, Klara Mrak, University of Natural Resources and Life Sciences, Vienna (BOKU), Austria

Regional policies for nutrient stewardship (hybrid)

Moderator: Robin Harder, Swedish University of Agricultural Sciences, Sweden Rapporteur: Nathalie Tijdink, Dutch Nutrient Platform, Netherlands

- A material flow model for the implementation of phosphorus recovery in a model region Hiep Le, RWTH Aachen, Germany
- Nutrient Content of Manures and Potential for Valorisation: Case Study of Monaghan and Tipperary, Ireland, Rosanna Kleeman, University College Dublin, Ireland
- Impact and opportunities for the urban water cycle of the 'fully circular in 2050' target of the Netherlands Circular Water 2050, Kees Roest, KWR Water Research Institute, Netherlands
- Closing the loop of Phoshorus cycle in the Visegrad Group (V4) countries, Marzena Smol, Polish Academy of Sciences, Poland
- Mapping the availability of nutrient-rich side-streams mission impossible? Elina Tampio, Natural Resources Institute Finland (Luke), Finland
- Sustainable agriculture as a vehicle of corporate reputation: sustainability within the value chain of food and agricultural production as a core element of business strategy, Michael Stopford, ANCORED & Ca' Foscari University, Italy

New technologies for nutrient recovery

Moderator: Matthias Zessner, Vienna University of Technology (TU-Wien), Austria Rapporteur: Francesco Fatone, Università Politecnica delle Marche, Italy

- Vacuum degasification/acidic-neutral absorption for nitrogen recovery from agricultural digestate, Johannes Koslowski, KWB, Germany
- Technical comparison of phosphorus recovery technologies from wastewater, Hanna Kyllönen, VTT, Finland

- A novel process for an efficient phosphorus utilization from cereal by-products in feed industry, Natalie Mayer, Hamburg University of Technology, Germany
- Flashphos Thermal behaviour of sewage sludge aiming at white phosphorus recovery, Sander Arnout, InsPyro, Belgium
- Yellow phosphorus production from secondary phosphorus resources by carbothermic reduction Takayuki Iwama, Tohoku University, Japan
- Acid-induced phosphorus release from hydrothermally carbonized sewage sludge, Carla Pérez, Umeå University, Sweden
- NPHarvest Calcium based P recovery process as a pre-treatment for N recovery, Juho Kaljunen, Aalto University, Finland
- The FlashPhos process critical resources and zero waste from sewage sludge, Lukas Pohl, University of Stuttgart

15h00 – 16h30 : Perspectives for research and market uptake Moderator: Chris Thornton, Secretary General, ESPP

- Nutrient R&D objectives under Horizon Europe. Katja Klasinc, European Commission DG RTD.
- Summaries of outcomes of each breakout sessions (research needs) Sessions Rapporteurs
- Questions and Discussion
- Key take-aways from the day identified by experts

Close

Posters on display during ESPC4 & PERM5

Phosphorus balance, release rates and mechanisms in a eutrophic coupled - reservoir system, Karel As, Bayreuth University, Germany

Use of vivianite obtained from water purification as phosphorus fertilizer, Tolulope Ayeyemi, University of Seville, Spain

Effect of rain variability and water retention measures on phosphorus loads at the farm scale, Victoria Barcala, Deltares, Netherlands

Granular iron-based materials for phosphate removal from waters, Oleksandr Bolielyi, GEOS, Ukraine

Improved soil testing system in the Czech Republic, valuation of p-content in carbonate soils, Pavel Cermak, Crop Research Institute, Czech Republic

The content of available phosphorus in soils of the Czech Republic, Pavel Cermak & Elizaveta Watzlova, Crop Research Institute, Czech Republic

Sugarcane bagasse ash and its blends with triple-superphosphate reduce the dependency on rock phosphate Vitalij Dombinov, Forschungszentrum Jülich GmbH, Germany

Sugarcane bagasse-based ashes as fertiliser for soybeans and the relevance of ash mineral composition on plant phosphorus availability, Vitalij Dombinov, Forschungszentrum Jülich GmbH, Germany

Slow-Release Fertilizers Based on Dispersed Struvite in Thermoplastic Starch Matrix Vitalij Dombinov, Forschungszentrum Jülich GmbH, Germany

Quinoa agricultural waste recycling: Evaluation of agronomic and physicochemical quality of quinoa compost Khadija El Hazzam, Mohammed VI Polytechnic University, Morocco

Structural Study on The Chemical Environment Surrounding Phosphorus in Ash Fractions Suitable for Nutrient Recovery, Sana Elbashir, Umeå University, Sweden

Assessing the bioavailability of several recycled phosphorus forms in alkaline soils, Ran Erel, Volcani Institute, Israel

Strategies for optimizing the scalable microbial synthesis of vivianite, Lordina Eshun, Manchester University, United Kingdom

Nutrient recycling with dry toilets as sustainable solution for communal waste management and regional economies, Albrecht Fritze, Technische Universität Berlin, Germany

Biological phosphorus removal from potato processing industrial wastewater – High phosphorus load, Dorothee Goettert, University of Antewerpen, Belgium

Egestabase – Navigating technologies for recovery and reuse of plant nutrients from human excreta and wastewater, Robin Harder, Swedish University of Agricultural Sciences, Sweden

Novel hybrid membrane process coupled with freeze concentration for phosphorus recovery from cheese whey, Ipan Hidayat, BETA Technology Centre, Spain

Phosphorus Recovery Methods from Secondary Sources, Assessment of Overall Benefits and Barriers with Focus on the Nordic Countries, Aida Hosseinian, University of Oulu, Finland

Development and evaluation of innovative technologies for the phosphate removal and recovery, Jia-Qian Jiang, Glasgow Caledonian University, United Kingdom

Using soil phosphorus sorption saturation with Mehlich 3 extractant to estimate risk of phosphorus losses, Beata Jurga, Institute of Soil Science and Plant Cultivation – State Research Institute, Poland

Exploration of low energy flotation process to selectively separate purple phototrophic bacterial biomass from anaerobic digestate, Bailee Maija Johnson, McGill University, Canada

Hydrothermal Carbonization (HTC) of Dairy Waste: Effect of Temperature and Initial Acidity on the composition and quality of solid and liquid products, Nidal Khalaf, University of Limerick, Ireland

Pilot- and industrial scale R&D at Emschergenossenschaft and Lippeverband: From Phos4You to AMPHORE, Daniel Klein, Emschergenossenschaft / Lippeverband

Production of a safe and nutrient-rich material from a mixture of human waste via pyrolysis, Malte Kraus & Kevin Friedrich, Björnsen Beratende Ingenieure GmbH, Germany

The Swedish Nutrient Platform - A Swedish Innovation Platform for Nutrient Reuse from Wastewater, Elin Kusoffsky, RiSE, Sweden

Nanofertilizer obtained by colloidal self-assembly of amphiphilic molecules for controlled release of phosphorus in soil, Luis Lightbourn, Lightbourn Research Institute, Mexico

Reduction kinetics of iron-rich by-products from drinking water treatment, Mingkai Ma, Utrecht University, Netherlands

Phosphorus leaching following a long-term cattle manure application, Bijesh Maharjan, University of Nebraska – Lincoln, USA

Extraction Effects on Polyphosphate Ion Diffusion as Detected with Gel Electrophoresis and 31P-DOSY-NMR Lori Manoukian, McGill University, Canada

Pilot scale Recovery of Calcium Phosphate from UASB effluent after elimination of Dissolved Inorganic Carbon, Boudewijn Meesschaert, KU Leuven, Belgium

Synthesis of struvite with compost slurry: analysis of the fertilizer potential for the circular economy, Rose Meira, Uni Federal do Oeste do Para, Brazil

Balancing multiple priorities for a circular phosphorus economy: spatial tools to help select processing locations, Geneviève Metson, Linköping University, Sweden

Production of manure derived P-fertilizers through a novel solar drying system for acidified digestates, L. Morey, A. Robles-Aguilar et al., IRTA, Spain

Nutrient pollution in Stockholm's water catchments: Systemically assessing its social, ecological, and technological determinants, Harrie Mort, Leeds University, United Kingdom

Effect of Fe addition on P retention in peaty freshwater sediment, Melanie Munch & Karel As, Utrecht University, Netherlands

Phosphate retention by Fe(III)- and Ca-phases formed upon oxygenation of anoxic groundwaters, Ville Nenonen, Eawag, Switzerland

Phosphorus recovery as struvite from hydrothermal carbonization liquor of chemically produced dairy sludge, Claver Numviyima, Politechnika Wroclawska, Poland

Transformation of Soluble Phosphate within Manure to a Less Soluble Calcium Phosphate Solid, Sidney Omelon and Tian Zhao, McGill University, Canada

Effect of phosphogypsum on faba bean and its nutrients and heavy metals uptake, M'Barka Outbakat, Mohammed VI Polytechnic University, Morocco

Sewage sludge compost and wastewater nutrient sources in forage production of Urochloa brizantha, Paulo Pavinato, University of São Paulo, Brazil

Phosphorus recovery from sewage treatment plant in Brazil through sorption and coagulation-flocculation Paulo Pavinato, University of São Paulo, Brazil

Cover crops and phosphate sources influencing cash crops yield and soil P dynamics, Paulo Pavinato, University of São Paulo, Brazil

Potential of waste-derived phosphate fertilisers for sugarcane production in a tropical soil, Henrique Raniro, University of Natural Resources and Life Sciences, Vienna (BOKU), Austria

Resource recovery on site - or how your toilet can turn urine into a dry nutrient product, Michel Elia Riechmann, Eawag, Switzerland

Removal of dissolved organic phosphorus from synthetic agro-industrial wastewater using ferric chloride, Ana Paula Nova, Universidad de la Republica, Uruguay

Recycled iron phosphates are not effective phosphorus fertilizers in the short term on lowland rice, Rochelle Joie Saracanlao, KU Leuven, Belgium

Investing in Phosphorus Fertilizer Recovery from Dairy Processing Wastewater, Jan-Philip Uhlemann, Wageningen University & Research, Netherlands

Thermochemical equilibrium calculations of char formation during co-pyrolysis of municipal sewage sludge with straw, Naeimeh Vali, University of Borås, Sweden

P-Trap - Diffuse phosphorus input to surface waters - New concepts in removal, recycling and management, Sylvia Walter, Thilo Behrends, and the P-TRAP team, Utrecht University, The Netherlands

Phosphorus and relationships with other nutrient in various soil tillage in the Czech Republic, Elizaveta Watzlova, Crop Research Institute, Czech Republic

Phosphorus and food security in India: opportunities and barriers to recycling phosphorus from human sewage, Diorbhail Wentworth, University of Edinburgh, United Kingdom

FT-IR Based Inline Analysis of Phytic Acid During Enzymatic P-Adjustment in Monogastric Animal Feeding, Niklas Widderich, Hamburg University of Technology, Germany

Selective Phosphate Removal and Recovery from Water Using Sorption, Baile Wu, Planck Institute of Colloids and Interfaces, Germany